ABSTRACT

DPN (decoupled plasma nitridation) is used to improve robustness of ultra thin gate oxides. Conventionally, this is followed by an anneal in pure helium to remove structural defects in the oxide. However, annealing under these conditions has been found to cause a deterioration of the electrical performance of devices. This problem has been overcome by annealing, in a 1:4 oxygen-nitrogen mixture (1,050 °C at about 10 torr) instead of in helium or nitrogen oxide. This results in a gate oxide that is resistant to boron contamination without suffering any loss in its electrical properties.